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Fatal Road Accidents at Christmas 1963

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FOREWORD

In 1960, at the request of the Minister of Transport, the Road Research Laboratory carried out an investigation into the fatal accidents which occurred at Christmas 1959. The Minister made a similar request in respect of the fatal accidents which happened at Christmas 1963 and this Technical Paper gives the results of the Laboratory's second investigation.

The assistance and co-operation of the police, the coroners, the Home Office and the Ministry of Transport in providing the details necessary for the inquiry are gratefully acknowledged.

W. H. GLANVILLE

May, 1964

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Fatal Road Accidents at Christmas 1963

SUMMARY

THERE WERE 121 fatal road accidents in which 132 persons were killed in England and Wales during four days of Christmas 1963 (23rd to 26th December inclusive). Fifty-two of these fatalities occurred in the twelve hours between 3.0 p.m. on Christmas Eve and 3.0 a.m. on Christmas Day. The average number of road deaths per day during the 4-day period was about 50 per cent greater than during the rest of December, 1963. Because of the large number of fatalities the Minister of Transport asked the Road Research Laboratory of the Department of Scientific and Industrial Research to carry out an investigation into the circumstances of the accidents. Information was supplied by the police forces and coroners concerned and in most cases a Laboratory representative examined the site and discussed the details with the police officers who dealt with the accident.

Aspects examined included the effects of weather, darkness, speed limits, lighting of streets and vehicles, and the consumption of beverages containing alcohol. Casualties and traffic at Christmas 1963 and in the twelve preceding Christmas periods were also studied. No attempt was made to deduce how many accidents were attributable to any particular cause because road accidents usually result from the simultaneous operation of several factors and it is not always possible to assign a single cause to each accident.

In nearly every year investigated, Christmas Eve or one of the days associated with Christmas Eve (e.g. Friday when Christmas Eve occurred on Sunday) had more casualties than any other day of the year. However, the abnormal numbers of casualties that occur each Christmas cannot be accounted for by increased traffic, because traffic in the Christmas period has been about the same or less than on other days in December in each year since daily traffic records first became available in 1956. Bad weather occurred in some districts at Christmas 1963, and could have accounted for some of the accidents, but exceptional weather is unlikely to have been responsible for the increase in casualties every Christmas. The increases must generally be attributed to factors associated with activities that occur at this period.

Information about the consumption of alcohol by persons involved in the fatal accidents was obtained from the police and coroners, but complete information on this point may not always have been available to them. No information was available about alcohol consumption by road users not involved in accidents. The amounts of alcohol reported to have been consumed ranged from "a drink" to

the equivalent of two-thirds of a pint of whisky (by a motorcyclist and a car driver) and one pint of whisky by a pedestrian. It was found that alcohol was consumed not long before the accidents by at least one-third of all the drivers involved (including riders of pedal cycles and motorcycles) and by one or more of the drivers or riders involved in at least 40 per cent of the accidents.

The proportion of road users involved in fatal accidents at Christmas 1963 known to have consumed alcohol not long before the accidents was much greater than that found in an investigation covering a sample of fatal accidents spread over the years 1953 to 1956 (including Christmas).

Other studies have shown that alcohol can increase the risk of accident and that small doses impair judgment and performance in tasks resembling driving. Taking these studies into account, the results of the present investigation point to the consumption of alcohol as an important factor in causing road casualties to increase during Christmas.

The increase in casualties during Christmas relative to normal days seems to be a minimum when Christmas Day falls on a Monday and a maximum when it falls on a Wednesday, Thursday or Friday. The increase in casualties at Christmas 1963, when Christmas Day was on a Wednesday, may be associated with this result. Christmas Day 1964 will fall on a Friday and there is a danger that casualties at Christmas may again be high.

INTRODUCTION

At the request of the Minister of Transport the Road Research Laboratory has investigated the circumstances of all the fatal road accidents that occurred in England and Wales during the Christmas period 23rd to 26th December, 1963, inclusive. The objects of the investigation were (i) to determine whether the number of accidents at Christmas was abnormally high and, if so, why and (ii) to see whether, by studying this particular group of accidents in more detail than is usually possible, any of the contributory factors could be identified.

A similar investigation was made into the fatal accidents that occurred at Christmas 1959.(1)

Every police force in which the fatal accidents occurred supplied from their records the fullest information available concerning the circumstances of the accidents. In most cases a Laboratory representative discussed the details with the police officer who dealt with the accident, and the coroners supplied copies of their inquest notes, post-mortem reports, and many useful comments. The police also supplied plans or photographs of most of the sites and photographs of the vehicles involved, the latter often taken *in situ* while or shortly after the police attended the accident. Where the vehicles were subsequently examined by a Ministry of Transport vehicle examiner his report was also made available to the Laboratory. Many of these details, some of which are not normally reported, form the basis of this report and all of them will be used for further research purposes.

The Laboratory is most grateful to all concerned for their ready and immediate response to requests for information, especially as this often made further demands on officers and resources already carrying a heavy burden of work.

The Laboratory supplemented these details in nearly all cases by taking overhead photographs of accident sites and by inspecting some of the vehicles involved.

ACCIDENT CAUSATION

Road accidents do not occur merely by chance; they result from the simultaneous operation of many different factors. Experience has shown that it is not generally possible to assign a single cause to an individual accident. On the other hand, by examining the circumstances of a group of accidents it is perfectly feasible to isolate one or more factors found to occur frequently (e.g. slippery roads or poor street lighting) and to reduce or remove their effect by taking suitable preventive measures. This report therefore makes no attempt to determine the number of accidents that were attributable to particular causes but seeks to distinguish any factors common to Christmas accidents as a whole.

The difficulties in applying the concept of causation to road accident analysis are dealt with at length in a Laboratory publication.(3)

THE NUMBERS OF ACCIDENTS AND DEATHS

The final number of deaths caused by road accidents during the period studied has proved to be about 20 per cent greater than the provisional totals published during or shortly after Christmas (see Table 1). The 132 deaths in England and Wales occurred in 121 accidents.

Table 1

Deaths in road accidents, Christmas 1963

	23rd Dec.	*24th Dec.*	*25th Dec.*	*26th Dec.*	*4-day total*
Final figures					
England and Wales ...	28	47	35	22	132
Scotland	3	3	4	4	14
					146
Provisional figures					
England and Wales ...	21	34	31	22	108
Scotland	0	5	3	4	12
					120

It should be noted that, in accordance with normal practice, only those persons who died within 30 days of the accident as a result of their injuries are regarded as having been killed. The final figures were not therefore available until the end of January, 1964. At least one person injured in a

Christmas accident is known to have died after this date but has not been included.

For completeness figures for Scotland have been included in Table 1 but they are *excluded* from the remainder of this investigation because Christmas is not observed as a public holiday to the same extent in Scotland as in England and Wales. It is hoped, however, to make a separate examination of the December statistics of road accidents in Scotland. All numbers in the text, tables and diagrams of the present report therefore refer to England and Wales only, and not to Great Britain, unless otherwise specifically stated.

The average number of fatalities per day in England and Wales during 1963 was 17. In the Christmas period (23rd to 26th December inclusive) the average number per day was 33 and more than half as much again as the average for the rest of December, 1963 (21 per day). The number of fatalities to be expected on four ordinary days of December would therefore be 84, or 48 fewer than actually occurred.

PERSONS KILLED

The road users killed in the 121 fatal accidents are given in Table 2.

Table 2

Fatalities by class of road user

Road user	Light hours	Dark hours	All hours	Percentage killed in dark
Pedestrians				
under 15	3	0	3	
over 15	11	43	54	80
Pedal cyclists	3	10	13	77
Motorcyclists				
riders	5	4	9	40
passengers	1	0	1	
Drivers	9	17	26	65
Other passengers	11	15	26	58
All road users	43	89	132	67

About twice as many people were killed in the dark as in daylight. One-third of those killed in daylight, and one-half of those killed in the dark, were pedestrians. About one-half of those killed were neither drivers nor passengers of motor vehicles.

In addition to the 132 persons killed 94 were injured in the 121 fatal accidents (Table 3). Most of the injured persons in the fatal accidents were drivers or passengers. It is thought likely that the average number of occupants per vehicle during the holiday period was higher than the average for non-holiday periods.

Table 3

Other persons injured in fatal accidents

	Light hours		Dark hours		Total injured
	Seriously injured	Slightly injured	Seriously injured	Slightly injured	
Pedestrians					
under 15					0
over 15		1	2	2	5
Pedal cyclists					0
Motorcyclists					
riders		2	1	1	4
passengers	2*				2
Drivers	4	8	8	11	31
Other passengers	9	8	17	18	52
Total	15	19	28	32	94

* Includes 1 side-car passenger

Table 4

Times at which people were killed, Christmas 1963

Hour beginning	Monday 23rd Dec.		Tuesday 24th Dec.		Wednesday 25th Dec.		Thursday 26th Dec.		4-day total	
	Pedestrians	Others	Pedestrians	Others	Pedestrians	Others	Pedestrians	Others	Pedestrians	Others
Midnight					4	2		1	4	3
1 a.m.					1	1			1	1
2 a.m.					1	2			1	2
3 a.m.					2	3			2	3
4 a.m.						1				1
5 a.m.										
6 a.m.		1								1
7 a.m.		1		1	1				1	2
8 a.m.	2	1	1						3	1
9 a.m.	1								1	
10 a.m.								1		1
11 a.m.	1	1			1	1			2	2
12 noon	1		1					3	2	3
1 p.m.			2			4		2	2	6
2 p.m.		1		1		2				4
3 p.m.	1		2	5		1		1	3	7
4 p.m.		1	5			3		1	5	5
5 p.m.	2	2	5	3		1	1	1	8	7
6 p.m.	2		3	2				1	5	3
7 p.m.	1		1	4	1			3	3	7
8 p.m.	2		1	1		1	1	2	4	4
9 p.m.		1		1				1		3
10 p.m.	3	1	2	2		1			5	4
11 p.m.	1	1	4			1		3	5	5
All hours	17	11	27	20	11	24	2	20	57	75

TIMES OF DAY

The numbers of persons killed in each hour of the 4 days are given in Table 4. Fifty-two persons (two-fifths of the 4-days' total) were killed in the 12 hours between 3 p.m. on Christmas Eve and 3 a.m. on Christmas Day, whereas 10 were killed in the same period of the following 24 hours. On Christmas Eve and Christmas Day combined 38 pedestrians were killed compared with 2 on Boxing Day. Other prominent features of the figures given in Table 4 are the total of 17 persons killed during the early hours of Christmas Day (i.e. before 5 a.m.) compared with 1 in the same hours on the other 3 days combined, and the very small number of pedestrians (five) killed during the rest of Christmas Day and Boxing Day. Traffic counts made by the Ministry of Transport at 17 sites indicate that traffic between the hours of 10 p.m. on Christmas Eve and 6 a.m. on Christmas Day, in which period 25 people were killed, was double that in the same hours on corresponding nights in January, 1964 (the only comparable period available). In these hours on a normal December night (i.e. excluding Christmas Eve and Christmas Day) the average number killed is 4 or 5.

WEATHER CONDITIONS

Visibility and the state of the road surface at the time of the accidents are given in Table 5.

Table 5

Road and light conditions

Date	Light hours			Dark hours			Total
	Dry	Wet	Icy	Dry	Wet	Icy	
23rd December	4	4	2 (1)	3	11	4 (1)	28 (2)
24th December	9	1	2	17	13	3	45
25th December	0	9	0	6	9	6 (1)	30 (1)
26th December	0	5 (2)	1	0	6 (1)	6 (2)	18 (5)
4 days	13	19 (2)	5 (1)	26	39 (1)	19 (4)	121 (8)

Numbers in brackets (included in the main number) are those which occurred in mist or fog

About two-thirds of the fatal Christmas accidents were in the dark and one-third of them happened when it was both dark and wet. Seventy-three per cent of all fatalities in Great Britain in the whole of December, 1963, occurred in dark hours. About one-fifth of the fatal Christmas accidents occurred in fog or mist or on icy roads, or both (Table 6). The incidence of fog and ice are so variable, especially over the space of a few days, that comparison with other periods is hardly practicable, but it may be noted that in both light and dark hours 60 per cent of the accidents (excluding those on icy roads) occurred while the road was wet. During the three previous Decembers the corresponding value for all accidents was 53 per cent. On Christmas Eve three-quarters of the accidents occurred in the dark and half of these were on wet or icy roads. All

Table 6

Fatal accidents in fog or icy conditions

	Light hours	*Dark hours*	*All hours*
Fog	2	1	3
Icy road	4	15	19
Fog and ice	1	4	5
	7	20	27

accidents during daylight on Christmas Day, and all those on Boxing Day, were on wet or icy roads. During the four days of Christmas, 1963, 67 per cent of the fatal and serious road casualties in England and Wales occurred on wet or icy roads but in the rest of December, 1963, the corresponding figure was 48 per cent. The figures in Table 6 are therefore consistent with general driving conditions during the Christmas period being bad in some districts but, although it is known that in such conditions accidents tend to be more frequent than usual,(2) this could not account for all of the estimated increase of 48 in fatalities.

Full moon occurred on 30th December, 1963. From 23rd December to 26th December the moon was increasing in brightness, setting at midnight or later, and this may have been of some help to road users in the dark.

CHRISTMAS ROAD SAFETY MEASURES

Two road safety measures were taken by the Ministry of Transport immediately before Christmas 1963:

(i) a speed limit of 50 mile/h was imposed during the hours of darkness on all roads (except motorways) in England and Wales normally unrestricted, from the evening of 23rd December to the morning of 27th December;

(ii) local authorities were asked to keep street lights switched on all night during the holiday period.

The numbers of fatal accidents in England and Wales have therefore been classified in Table 7 according to speed limits and conditions of street lighting at the time.

Three-quarters of the fatal accidents occurred on roads subject to speed limits of 30 or 40 mile/h. During December, 1963, the proportion of fatal casualties in the whole of Great Britain on roads with a speed limit was 66 per cent.

Nearly one-half of the 121 fatal accidents occurred during dark hours on roads with a 30 mile/h speed limit. Although about 10 per cent of roads in Great Britain with a speed limit of 30 mile/h have no street lighting(3) none of these accidents during the dark occurred on such roads.

It is not known how many street lights were switched on for longer than usual at night in response to the Ministry's request, but only four of the fatal accidents in the dark on roads with street lighting occurred while the lights were switched off.

Table 7

Numbers of fatal accidents classified by street lighting conditions

Speed limit (mile/h)	Light hours	Dark hours				Total
		Street lights switched on	Street lights off	No street lighting	Street lighting not ascertained	
30	30	50	3	0	3	86
40	1	4	0	1	0	6
50 (dark only) ...	—	6	1	16	0	23
None	6	—	—	—	—	6
Motorways ...	0	0	0	0	0	0
All roads	37	60	4	17	3	121

During the 4-day period and while the 50 mile/h speed limit was in operation there were 23 fatalities on the roads to which the limit applied; there were also four times as many accidents in the dark as in daylight. Unfortunately the effect of the limit in dark hours cannot be satisfactorily assessed because insufficient traffic data are available to give a reliable estimate of traffic flows during the restricted hours and in a suitable control period.

There were no fatal accidents on motorways in these 4 days.

VEHICLE LIGHTING

Table 8 shows, where the information was available, the state of vehicle lighting on all motor vehicles involved* in fatal accidents in the dark, together with the state of the street lighting at the time of the accidents.

In the 84 fatal accidents which occurred in the dark (Table 5) 110 motor vehicles of all kinds were involved, of which 7 were stationary (not being held up by other traffic). Only 10 of the 103 moving vehicles were using full headlights; 39 were using dipped headlights and 24 were using sidelights. Fifty-two vehicles for which lighting information is known were involved in fatal accidents in the dark on roads with street lights on; 25 of these vehicles were using dipped headlights.

Lighting on the vehicles which collided with the 43 pedestrians killed in the dark is given in Table 9. Considering only those accidents which occurred while the street lights were on, and ignoring the vehicle with full headlights and those whose lighting was not known, dipped headlights were being used by 12 of the 21 vehicles which struck pedestrians in the dark on roads with good street lighting. Five of the 9 vehicles which struck pedestrians on other roads with street lights switched on were also using dipped headlights.

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* i.e. those actually in collision or whose actions contributed directly to the accident

Table 8

Lighting on motor vehicles involved in fatal accidents

Class of vehicle	State of lights on vehicle	Street lights switched on			Street lights off	No streets lights	Street lighting details not ascertained
		Good (Group A)*	Poor (Group B)*	Type not ascertained			
Cars ...	Headlights						
	full				3 (1)	4 (1)	
	dipped ...	14 (10)	1	3 (3)		6	
	Sidelights only ...	16 (9)		3 (3)		2†	1 (1)
	Parking lights ...	1†					
	None			1†			
	Not known ...	7 (1)	1	6 (5)		4	1
Goods vehicles	Headlights						
	full	1 (1)			1	1	
	dipped ...	2 (1)	1 (1)			7‡(1)§	
	Sidelights only ...	2		1 (1)	1†		
	None	1†					
	Not known ...	3 (1)	1 (1)			4	1
Public service vehicles	Headlights						
	dipped ...	1				1	
	Sidelights only ...	1					
Motorcycles	Headlights						
	dipped ...	2 (1)	1 (1)			1	
	Not known ...	2					

Numbers in brackets (included in the main number) are vehicles which collided with pedestrians

* Group A and B standards of street lighting are defined in B.S. Code of Practice CP 1004, Parts I and II. Approximately, Group A lighting is suitable for main traffic routes and Group B for all other roads

† Stationary (not held up by other traffic)

‡ One of these was stationary

§ Struck two pedestrians

Table 9

Lighting on motor vehicles which struck pedestrians

Vehicle lights	Street lights switched on			Street lights off	No street lights	Street lighting details not ascertained
	Good (Group A)	Poor (Group B)	Type not ascertained			
Headlights						
full	1			1	1	
dipped ...	12	2	3		1	
Sidelights only ...	9		4			1
Not known ...	2	1	5			

No reliable estimate is available of the proportion of all vehicles which use dipped headlights at night on roads with good street lighting; experience suggests that it is usually small, although during the 1962–63 dipped headlights campaign in Birmingham the proportion of drivers using dipped headlights on such roads was about 45 per cent.(4)

On the whole, the data in this section do not provide any obvious evidence that vehicles using dipped headlights are any more or less likely to be involved in accidents than other vehicles.

CRASH HELMETS

Casualties to riders and pillion passengers on motorcycles are given in Table 10, separated, where known, into those wearing and those not wearing crash helmets.

Table 10

Use of crash helmets by motorcycle casualties

Casualty		Fatal	Serious	Slight	Total
Riders ... ... (13 casualties)	Wearing crash helmet ...	5	0	2	7
	Not wearing crash helmet	3	0	0	3
	Not known if wearing helmet	1	1	1	3
Passengers ... (2 casualties)	Not wearing crash helmet	1	0	0	1
	Not known if wearing helmet	0	1	0	1

Of the 10 riders and pillion passengers killed in these accidents, 5 are known to have been wearing crash helmets and 4 were not. Two of the five survivors are known to have been wearing helmets.

It is estimated from observations made in 1962 that about 66 per cent of all scooter and motorcycle riders, and 49 per cent of pillion passengers, then used crash helmets, but the above Christmas accident figures are obviously too small to permit detailed comparisons with these national averages.

USE OF SEAT BELTS

Seat belts are known to have been fitted in 4 of the total of 95 private cars involved in the fatal accidents. It is also known that in 75 of the cars they were not fitted but it was not possible to ascertain if they were fitted in the remaining 16. The belts were not being used at the time of the accident by any of the occupants in the 4 vehicles which had them fitted.

It was estimated that in 1962 about 7 per cent of cars in use were fitted with seat belts and that at any instant nearly 30 per cent of drivers did not wear the belt although one was fitted,(5) but there is some evidence that a greater proportion of cars now have them fitted.

In considering possible reasons for the increase in the number of casualties at Christmas it is necessary to know whether the amount of traffic on those days was greater or less than on other comparable days in December. An estimate of the amount of motor-vehicle traffic during Christmas and during suitable comparison periods of December, 1963, on all classified roads of Great Britain has therefore been made, using the traffic records obtained by means of automatic counters which have been maintained by the Laboratory since 1956 at 50 permanent census points on the road system. Because both the amount of travel and the casualty rate are different on Saturdays, Sundays and weekdays(5) it is necessary for the days of the week to appear in the same proportions in each of the periods compared. These differences in casualty rate may be partly caused by variations in the composition of the traffic, the number of passengers in motor vehicles and the proportion of travel in dark hours.

The first comparison made was between the 4 days 23rd to 26th December inclusive and the same days of the week earlier in the same month (Table 11).

Table 11

Traffic and total casualties in Great Britain: 23rd to 26th December compared with same days of week earlier in December

Year	Christmas Day on	Percentage change in daily average		
		Traffic	Total casualties	Casualty rate
1956* ...	Tuesday	− 29	+ 8	+ 51
1957 ...	Wednesday	− 11	+ 29	+ 46
1958 ...	Thursday	− 10	+ 33	+ 47
1959 ...	Friday	− 14	+ 38	+ 60
1960 ...	Sunday	− 4	+ 19	+ 24
1961 ...	Monday	− 12	− 1	+ 12
1962 ...	Tuesday	− 17	− 3	+ 17
1963 ...	Wednesday	− 18	+ 50	+ 83

* Affected by petrol rationing

Petrol rationing was in operation in December, 1956, because of the Suez crisis and that year is therefore not typical. In the other years, however, it is clear that total traffic at Christmas has been appreciably less than that on similar days of the week earlier in December, and at Christmas 1963 it was about 18 per cent less than usual. None of the increases in casualties in Table 11 can therefore be attributed to increased traffic.

In spite of there being less traffic than usual at Christmas there were more casualties than normal in 6 of the 8 years studied and the relative casualty rate per vehicle-mile was higher in every year. The relative casualty rate also varied according to the day of the week on which Christmas Day fell. Changes in the numbers of casualties in these periods between 1951 and 1963 are shown in Fig. 1. This figure and Table 11 indicate that the increases both in casualties and in the relative casualty rate were high when Christmas Day fell on a Wednesday, Thursday or Friday and low when it fell on a Monday or Tuesday.

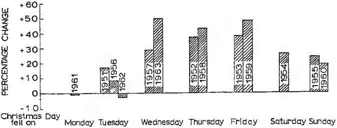

Fig. 1. Percentage change in average daily number of casualties in Great Britain (23rd December to 26th December inclusive compared with same days of week earlier in December)

It is possible, however, that the special conditions associated with the increase in casualties at Christmas may have commenced before the 4-day period considered above. For example, if Christmas Eve falls on a Sunday many office and works parties may take place on the preceding Friday. Another analysis was therefore made comparing traffic and casualties in the period 18th to 26th December inclusive (i.e. Christmas Day, Boxing Day and the whole of the preceding 7 days) with those in a similar period

Table 12

Traffic and casualties in Great Britain: 18th to 26th December compared with 4th to 12th December

Year	Christmas Day on	Percentage change in traffic	Percentage change in casualties			Percentage change in casualty rate		
			Killed	Killed and serious	All casualties	Killed	Killed and serious	All casualties
1957 ...	Wednesday...	− 2			+27			+29
1958 ...	Thursday ...	0			+21			+21
1959 ...	Friday ...	− 4	+45	+29	+24	+51	+34	+29
1960 ...	Sunday ...	0	+57	+26	+21	+57	+26	+21
1961 ...	Monday ...	− 2	+ 2	+12	+11	+ 4	+14	+13
1962 ...	Tuesday ...	0	+27	+18	+19	+27	+17	+18
1963 ...	Wednesday...	− 8	+25	+27	+31	+36	+38	+42

earlier in December (4th to 12th December inclusive)*. This gave Table 12 and Fig. 2, which show trends similar to those in Table 11 and Fig. 1: in spite of there being the same or less traffic than normal during this 9-day period the numbers of persons killed or injured increased considerably.

The total casualty rate per vehicle-mile increased every year, the increases ranging from 13 per cent to 42 per cent. For each of the 5 years for which the data are available the fatal casualty rate, and the fatal and serious casualty rate, were also higher at Christmas. The smallest increases in casualties, and in the fatal and total casualty rates, occurred when Christmas Day fell on a Monday.

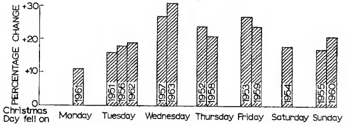

Fig. 2. Percentage changes in total casualties in Great Britain (18th December to 26th December inclusive compared with 4th December to 12th December inclusive)

There is therefore some confirmation that the increase in casualties which is associated with Christmas is least when Christmas Day falls on a Monday.

Christmas Day 1964 will fall on a Friday. It is therefore to be expected that the increase in casualties in the Christmas period will again be high.

Table 13 shows the number of road casualties in Great Britain on certain days at or near Christmas for the years 1951 to 1963 inclusive, together with the days having most casualties in the rest of December and in the rest of the year (i.e. January to November inclusive) where these details are available.

In every year of the 13 listed the highest number of casualties on any one day in December occurred between 22nd December and 26th December, usually on Christmas Eve. In nine of the years daily totals are available for every day of the year and in seven of these nine the day with the greatest number of casualties occurred at Christmas.

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* The effect on accidents of any differences between the two periods in the proportions of light and dark hours would have been small

Table 13

Daily casualties in Great Britain, 1951–1963

Year	Christmas Day on	Casualties					Day with most casualties	
		22nd Dec.	23rd Dec.	24th Dec.	25th Dec.	26th Dec.	in rest of December	in rest of year (Jan.–Nov. incl.)
1951	Tuesday	827	398	1075	430	565	1st December: 851	28tb July: 1155
1952	Thursday ...	645	779	1379	530	529	12th December: 784	2nd August: 1127
1953	Friday	778	1040	1453	594	709	4th December: 789	25th July: 1185
1954	Saturday... ...	876	966	1442	674	454	11th December: 897	17th July: 1279
1955	Sunday	886	1519	1387	765	722	3rd December: 1112	10th September: 1296
1956*	Tuesday	848	529	1057	521	624	19th December: 1023	11th August: 1487
1957*	Wednesday ...	590	1060	1684	731	620	21st December: 1266	27th July: 1666
1958	Thursday ...	1018	1057	1894	872	924	13th December: 1239	12th July: 1557
1959	Friday	1257	1326	2553	1014	1114	5th December: 1563	10th October: 1714
1960	Sunday	1128	1840	1513	793	747	3rd December: 1516	
1961	Monday	1886	1295	795	764	961	2nd December: 1558	
1962	Tuesday	1833	612	1102	575	1333	21st December: 1600	
1963	Wednesday ...	890	1241	1747	1167	1240	21st December: 1667	

* Petrol rationing 17th December, 1956 to 15th May, 1957

THE CRIMINAL RECORDS OF THE DRIVERS INVOLVED

Attention has recently been drawn to the possibility that people with a record of previous criminal convictions are especially likely to be involved in accidents. An attempt was therefore made to discover any criminal backgrounds to the drivers involved in the fatal Christmas accidents. Out of 117 of the drivers concerning whom inquiries have been completed to date, 13 (11 per cent) had previous records of criminal non-traffic offences; some of these had records of traffic offences also. A further 18 (15 per cent) had previous convictions for serious traffic offences only.

The proportions of the general driving population with various types of criminal records are, unfortunately, not known but the proportion with non-motoring criminal records is believed to be appreciably less than the 11 per cent mentioned above.

Eight cases occurred of collisions between two vehicles one of which was driven by a person with a criminal record and one driven by a person without such a record. In five of these eight cases the person with the criminal record was regarded by the police as the offending driver.

It may be that drivers with criminal records are more likely than others to be involved in accidents but, since nearly 90 per cent of the drivers involved had no criminal records, it appears that the great majority of accidents (88 per cent) did not involve such drivers.

ALCOHOL

For this analysis an accident in which at least one of the riders, drivers or pedestrians involved was reliably known to have consumed some alcohol not long before the accident (i.e. within a few hours) is termed a 'drink' accident. This does not mean that alcohol is regarded as the specific cause of the accident. Consumption of alcohol by passengers has been ignored, although in some cases the drivers' behaviour may have been influenced by that of a passenger who had been drinking.

References to alcohol made in the reports of the 'drink' accidents are listed in Appendix 1 (p. 24) in order to indicate the amounts consumed. Six of the accidents would not have been classified as 'drink' accidents from the reports submitted to the Laboratory; the additional information was obtained by the Laboratory representative who visited the sites and talked to the police officers involved. Some of the amounts of alcohol consumed are considerable but some are comparatively small. The significance of these small doses is mentioned later. In several instances there was reason to think that the amount consumed was greater than that indicated. In some accidents it is possible that somebody involved had been drinking but unless there was reliable confirmation of this the accident has not been classed as a 'drink' accident. In other words, it is not certain that all of the road users in the non-drink accidents had *not* been drinking. For this reason the proportion of persons involved who had been drinking is probably under-estimated. The proportion of road users not involved in accidents who had consumed alcohol was not available.

The incidence of known drinking among the riders and drivers involved in the 121 fatal accidents is given in Table 14.

Table 14

Drivers and riders involved in 121 fatal accidents

Age	Been drinking	Not been drinking	Not ascertained whether driver had been drinking	Total	Percentage that had been drinking
15–19	3	8		11	27
20–24	10	22		32	31
25–29	9	17	2	28	35
30–39	15	22		37	41
40–49	7	20		27	26
50–59	6	15		21	29
60–69	2	4		6	22
70–79		3		3	
Not known			2	2	
All ages	52	111	4	167	32

Excluding the four cases for which the information was not ascertained, at least 32 per cent of all the riders and drivers involved had been drinking. There was some evidence that the proportion of riders and drivers involved who had been drinking was highest in the 30–39 age group and lowest amongst the young and old.

It is known that in 58 of the 121 fatal accidents (48 per cent) somebody involved (i.e. a rider, driver or injured pedestrian) had been drinking alcohol shortly before the accident; the corresponding figure in the 1959 investigation was 56 per cent.(1) The difference between the two figures is not statistically significant.

Some additional information, given in Table 15, about fatal drink accidents at Christmas 1963 shows that on 23rd December, which for most people was an ordinary working day, 5 per cent of the pedestrians involved (i.e. killed or injured) in the fatal accidents, and 8 per cent of the riders or drivers involved (whether injured or not), had been drinking. In 11 per cent of the fatal accidents on this day one or more of the riders or drivers is known to have been drinking; this result is similar to the average value of 14 per cent estimated for normal conditions from an earlier and larger investigation(7) into a sample of 352 fatal accidents spread over the years 1953 to 1956 including Christmas.

On the other three days of Christmas 1963 (24th, 25th and 26th December) the proportion of road users involved in fatal accidents known to have been drinking was very much greater. The maximum occurred on Christmas Day, when at least 59 per cent of riders and drivers and 58 per cent of pedestrians had been drinking. It is known that in two-thirds of the fatal accidents on that day at least one of the riders or drivers involved had been drinking.

Table 15

Drinking and fatal accidents at Christmas 1963

Accident details	23rd Dec.	24th Dec.	25th Dec.	26th Dec.	4-days
Total number of fatal accidents	28	45	30	18	121
Fatal accidents in which at least 1 rider or driver had been drinking	3	17	20	9	49
Percentage of all fatal accidents	11	38	67	50	40
All fatal 'drink' accidents ...	3	24	21	10	58
Percentage of all fatal accidents	11	53	70	55	48
Number of pedestrians involved	19	29	12	2	62
Percentage that had been drinking	5	41	58	(100)	34
Number of riders and drivers involved	41	60	39	24	163
Percentage that had been drinking	8	28	59	38	32

There were 29 accidents involving only one moving vehicle (i.e. no other vehicles or pedestrians were concerned) and in 21 of these (72 per cent) it is known that the driver had been drinking.

The age groups of the pedestrians killed, and whether they had been drinking, are given in Table 16. Three of the pedestrians killed were children; at least 18 of the remaining 54 (i.e. 33 per cent) had been drinking; the corresponding proportion found in the study mentioned above(7) was 13 per cent. The proportion of pedestrians killed who had been drinking was lowest for the over-60 age group, a result similar to that obtained from Table 14 for drivers and riders. Fourteen of the 57 pedestrians killed (i.e. 25 per cent) were hit by vehicles whose drivers had been drinking.

Table 16

Details of pedestrians killed

Age	Number killed	Pedestrian killed had been drinking	Driver had been drinking
0–14	3	0	0
15–29	4	1	3
30–59	13	7	5
60+	37	10	6
All ages	57	18	14

It is known that the consumption of alcohol can increase the risk of accident.(8) Studies have also shown that the consumption of comparatively small quantities of alcohol (not sufficient to produce obvious intoxication does, on the average, impair performance and judgment in tasks resembling driving, the impairment increasing progressively as the level of blood alcohol rises.(9) Other things remaining constant, the number of accidents would therefore be expected to increase if the proportion of road users who have consumed alcohol rises.

The present analysis has shown that casualties at Christmas are more frequent than at other times, and that the proportion of drivers and other road users involved in Christmas accidents who are known to have consumed alcohol is also much higher than at other times. These results, combined with the results of investigations into the known effect of alcohol consumption, support the conclusion that alcohol was the main factor in bringing about the increased number of casualties.

Some of the accidents involving riders or drivers who had been drinking occurred in fog or icy weather, or involved a pedestrian who had been drinking. As these conditions occur mostly at night, riders and drivers in accidents during the dark hours only have been sub-divided as shown in Table 17.

Table 17

Drivers and riders in fatal accidents in the dark

		Excluding accidents in fog and ice		
	All accidents	Pedestrian killed		No pedestrian killed
		Pedestrian had been drinking	Pedestrian had not been drinking	
Drivers and riders				
had been drinking	42	9	3	16
had not been drinking ...	66	8	19	29
not known	4	1	1	2
Percentage that had been drinking	39	53	14	35
		28		
Total number of accidents ...	84	17	22	25

It has already been shown (Table 14) that 32 per cent of all the drivers and riders involved in the 4 days' fatal accidents are known to have been drinking. Table 17 shows that, in the dark accidents only, at least 39 per cent of drivers and riders had been drinking and that, excluding accidents in fog and ice and those in which the pedestrian concerned had been drinking, 28 per cent of the riders or drivers in the remaining 47 accidents in dark hours had been drinking.

The returns of accidents submitted monthly by the police to the Ministry of Transport stated that police action for driving under the influence of drink was taken, or would have been taken but for the death or serious injury of the person concerned, against six of the riders and drivers involved in the 49 accidents in which a driver or rider was known to have been drinking. Other proceedings may have been initiated later.

OTHER FEATURES PRESENT IN THE ACCIDENTS

Some of the features mentioned in the accounts of the accidents are tabulated in Appendix 2 (p. 27). As explained earlier in this report, these were not necessarily the 'causes' of the accidents in which they were mentioned; on the other hand, they may have been present in others but not reported.

Of those listed, the most frequently mentioned was skidding before or after the accident (in one-third of the accidents); 17 of these occurred on icy roads, which were mentioned in 24 accidents. Loss of control was mentioned in 18 accidents, in 14 of which the driver had been drinking. In at least 8 accidents the driver was clearly breaking the law or a traffic regulation (excluding possible cases of careless or dangerous driving). In nearly one-fifth of the accidents a driver was said to be going too fast for

Table 18

Some comparisons with 1959 results

	1959	1963
Persons killed on		
Christmas Eve	69	47
Christmas Day	37	35
Boxing Day	31	22
Riders or drivers of motor vehicles killed (as percentage of all killed)	45	47
Percentage of accidents in which		
Vehicle defect mentioned	8	17*
30 mile/h speed limit in operation	70	71
Driver going too fast for conditions	11	18
One or more drivers been drinking	36	40
Somebody involved been drinking	56	48
Percentage of road users involved known to have been drinking		
Pedestrians	53	34†
Pedal cyclists	(14)	(23)
Motorcyclists	14	23
Drivers	31	34

Figures in brackets are based on small numbers

* Significantly different from 1959 value (perhaps because more details were available for 1963 accidents)

† Significantly different from 1959 value

conditions; in more than half of these accidents that driver had been drinking.

Lack of care on the part of pedestrians while crossing the road was mentioned in 14 accidents. Pedestrians wearing dark clothes at night were mentioned in 10 accidents.

Vehicle defects were found in 20 accidents, although they may not always have played a part in the accident. In 12 of these accidents a driver had been drinking.

SOME COMPARISONS WITH THE 1959 INVESTIGATION

The present investigation is similar to that carried out for the fatal accidents at Christmas 1959.(1) Not all of the results obtained in the two studies are directly comparable because they depend on variable factors such as weather and amount of traffic, as well as on the amount and kind of accident information obtained in the two investigations. Table 18 shows, however, that the principal findings are very similar.

CONCLUSIONS

From this investigation into the circumstances of the fatal road accidents that occurred in England and Wales during the Christmas period 1963 the following conclusions have been drawn. On the whole the findings of the present investigation are very similar to those obtained in the 1959 Christmas accident investigation.

The numbers killed

(1) In the four days 23rd to 26th December, 1963, inclusive, 132 people were killed and 94 injured in 121 fatal road accidents. Of those killed 43 per cent were pedestrians, 10 per cent were pedal cyclists and 47 per cent were drivers or passengers of motor vehicles.

(2) The average number of deaths per day during the 4-day period was about 50 per cent greater than during the rest of December, 1963.

(3) Fifty-two of the 132 fatalities occurred between 3 p.m. on Christmas Eve and 3 a.m. on Christmas Day.

Some features of the accidents

Character of road, lighting and weather conditions

(4) Three-quarters of the fatal accidents at Christmas occurred on roads subject to speed limits of 30 or 40 mile/h. The proportion of fatal casualties in Great Britain on roads with a speed limit during December, 1963, was 66 per cent.

(5) 69 per cent of the fatal accidents and 67 per cent of the fatalities at Christmas 1963 occurred in dark hours. The proportion of all fatalities in Great Britain in dark hours in December as a whole was 73 per cent. (At Christmas 1959 81 per cent of the fatal accidents occurred in the dark.)

(6) Fog or icy roads (or both) were present in about one-fifth of the accidents and one-third occurred when it was both dark and wet. The road was wet or icy in two-thirds of the accidents.

(7) Four of the 64 accidents in the dark on roads with a system of street lighting occurred while the street lights were switched off.

(8) Fifty-two vehicles for which vehicle lighting information is known were involved in fatal accidents in the dark on roads with street lights on; 25 of these vehicles were using dipped headlights. Dipped headlights were being used by 12 of the 21 vehicles which struck pedestrians in the dark on roads with good street lighting.

Speed

(9) In 18 per cent of the accidents a driver was stated to have been going too fast for conditions.

Loss of control

(10) Loss of control of the vehicle was mentioned in 18 accidents; in 14 of these the driver or rider is known to have been drinking.

Drivers' criminal records

(11) 11 per cent of 117 drivers involved concerning whom details have been obtained had previous records of criminal non-traffic offences. These drivers were involved in 12 per cent of the accidents.

Protective devices

(12) Of the ten riders or pillion passengers of scooters and motorcycles who were killed, five were wearing crash helmets, four were not wearing helmets, and one case was not known. Two of the five survivors are known to have been wearing helmets.

(13) Four of the 95 private cars involved had seat belts fitted but none of the occupants of these vehicles was wearing the belt at the time of the accident.

Available information on alcohol consumption

(14) The information on alcohol consumed is probably not complete but it is known that beverages containing alcohol had been consumed shortly before the accident by at least

(*a*) one-third of all pedestrians killed,

(*b*) one-third of all drivers involved,

(*c*) one-quarter of all riders of motorcycles or pedal cycles,

(*d*) one driver or rider in 40 per cent of the accidents,

(*e*) somebody in 48 per cent of the accidents, and by

(*f*) the drivers of nearly three-quarters of the single vehicle non-pedestrian accidents.

For all times of the year the proportions corresponding to (*a*) and (*d*) were 13 per cent and 14 per cent respectively, as estimated from an investigation covering the years 1953 to 1956.

(15) In view of (14), and the results of investigations which have shown that alcohol can increase the risk of accident, it is concluded that the consumption of alcohol was the main factor in increasing the casualty rate at Christmas.

Casualties and traffic flow

(16) The number of casualties during the 4-day Christmas period has been higher than on similar days of the week in 6 out of the 8 years 1956–63. In the other two years, it was almost the same. The number of casualties per vehicle-mile travelled has been appreciably greater during the Christmas period in every one of these years. The highest daily number of casualties in the year usually occurs on a day at or near Christmas.

When comparisons were made between the period 18th to 26th December and 9 similar days of the week earlier in the month the average traffic flow was found to be about the same in the two periods but the number of casualties was appreciably higher during the Christmas period in every year. The average casualty rate per vehicle-mile at Christmas ranged from 13 to 42 per cent higher than earlier in the month.

(17) The increase in the number of casualties and in the casualty rate at Christmas seems to be affected by the day of the week on which Christmas Day falls. The increase was least when Christmas Day fell on a Monday and highest when Christmas Day fell on a Wednesday, Thursday or Friday.

This suggests that the increase in casualties during the Christmas period 1964, when Christmas Day will fall on a Friday, will again be high.

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APPENDIX I

REFERENCES TO ALCOHOL IN ACCOUNTS OF ACCIDENTS

Drivers (including motorcyclists and pedal-cyclists) had been drinking

Time (nearest hour)	
1 p.m.	Driver had 1 rum and blackcurrant shortly before accident.
2 p.m.	One driver had been drinking heavily (beer and brandy). Other two drivers had a drink at public house.
2 p.m.	Motorcyclist said he had been drinking.
2 p.m.	Driver said he had "only 3 or 4 pints of beer".
3 p.m.	Driver had been drinking beer and whisky from 11 a.m. to 2.30 p.m.
3 p.m.	Pedal cyclist had 4 beers and 2 rums in preceding 1½ hours.
3 p.m.	Motorcyclist had been drinking and friends asked him not to ride.
4 p.m.	Driver's urine contained 155mg of alcohol per 100ml.
5 p.m.	Urine tests showed equivalent of 5 pints of beer or 8–9 oz of spirits.
5 p.m.	Driver's breath smelt of drink.
5 p.m.	Pedal cyclist had just left party at hotel. Post-mortem showed alcohol in stomach.
6 p.m.	Post-mortem showed equivalent of 4½ pints of beer.
6 p.m.	Driver had bottle of stout and small bottle of beer during afternoon.
6 p.m.	Driver had blood alcohol content of 163mg per 100ml.
6 p.m.	Driver's blood indicated a minimum of 166mg of alcohol per 100ml.
6 p.m.	Driver had been drinking but was not considered unfit.
7 p.m.	Driver said he had had one drink.
7 p.m.	Urine test indicated driver had consumed about 5 pints of beer.
8 p.m.	Driver had been drinking at office party.
8 p.m.	Driver's breath smelt of alcohol.
8 p.m.	Driver had about 6 cans of beer before 7 p.m.
9 p.m.	Driver had been drinking.
9 p.m.	Driver had been drinking "quite a lot" between 5.45 p.m. and 8 p.m. Post-mortem showed some alcohol in stomach.
10 p.m.	Pedal cyclist was known to be a heavy drinker. He had consumed a large amount of alcohol on the day of the accident and had been drinking in various public houses from 6 p.m. onwards.
10 p.m.	Driver's urine indicated recent consumption of 4½ pints of beer or 7½ oz of spirits.
11 p.m.	Driver had been drinking but was considered fit to drive.
11 p.m.	Driver had been drinking but not sufficient for police action.

Time (nearest hour)	
11 p.m.	Driver had 3 or 4 whiskies in public house shortly before accident.
11 p.m.	Driver had consumed about 4 milk stouts between 9 and 10.45 p.m.
Midnight	Driver's blood contained 164mg of alcohol per 100ml.
Midnight	Motorcyclist had blood alcohol content of 245mg per 100ml. Driver had drunk 4 pints of beer and 1 whisky.
Midnight	Driver said he had had 7 light ales and 1 whisky during the evening.
1 a.m.	Driver had been in public house until midnight and had consumed a number of whiskies.
1 a.m.	Driver's urine contained 230mg of alcohol per 100ml.
2 a.m.	Driver had been drinking in public house until 11.30 p.m. and then had 1 whisky at 12.30 a.m. His passenger, who was killed, had blood alcohol content of 170mg per 100ml.
2 a.m.	Driver had been drinking but was not intoxicated.
3 a.m.	Driver had "had a drink".
3 a.m.	Driver was in bar from 10.15 to 10.45 p.m. and then went to dance.
4 a.m.	Driver's breath smelt of alcohol; he had been drinking at a party. Inquest verdict mentioned possibility of driver's reaction being impaired by alcohol.
4 a.m.	Driver had been drinking at party in evening and had 1 drink after midnight.

Pedestrians had been drinking

Time (nearest hour)	
4 p.m.	Post-mortem showed 327mg of alcohol per 100ml of blood.
5 p.m.	Pedestrian had a tot of whisky half an hour before.
5 p.m.	Blood alcohol content was 41mg per 100ml.
6 p.m.	Post-mortem showed pedestrian had consumed 6½ pints of beer or 11½ oz of spirits.
7 p.m.	Post-mortem revealed equivalent of 1 pint of beer.
9 p.m.	Pedestrian had 7 bottles of stout between 5 and 8.30 p.m.
11 p.m.	Blood alcohol content was 239mg per 100ml.
11 p.m.	Pedestrian had been in public house since about 9 p.m.
Midnight	Pedestrian had 2 pints of beer and a Guinness during the evening.

Drivers and pedestrians had both been drinking

Time (nearest hour)	
10 p.m.	Pedestrian had consumed 2 pints of beer. Driver had consumed 1 beer and 2 small whiskies.
11 p.m.	Pedestrian had been in public house drinking until just before 11 p.m. Blood alcohol content was 130mg per 100ml. Driver "had been drinking more than a little".

Time (nearest hour)	
11 p.m.	Pedestrian had 4 half pints of beer between 8 and 10 p.m. Driver had 1 pint of beer after 10 p.m.
11 p.m.	Pedestrian's urine indicated he had consumed the equivalent of 5 pints of beer or 10 single whiskies. Driver had 2 or 3 drinks at office party.
Midnight	Pedestrian's blood alcohol content was equivalent to 3¼ pints of beer or 5 oz of spirits. Driver had been in public house but was not considered intoxicated.
Midnight	Pedestrian's blood alcohol content was 163mg per 100ml. Driver had consumed about 6 pints of beer but was not considered drunk.
Midnight	Pedestrian's blood alcohol content was 370mg per 100ml (equivalent to nearly 1 pint of whisky). Driver had been drinking but was not considered " under the influence ".
2 a.m.	Pedestrian had blood alcohol content of 141mg per 100ml. Driver had been drinking but was not " under the influence ".
2 a.m.	Driver thought to have had one or two drinks. Pedestrian had 2 or 3 bottles of Guinness 2 hours before accident.

APPENDIX 2

SOME FEATURES MENTIONED IN THE ACCOUNTS OF ACCIDENTS

	Total times factor mentioned	*Driver had been drinking*	*Pedestrian had been drinking*	*Driver and pedestrian both been drinking*
Drivers and riders				
Inattentive, attention diverted	9	2	1	2
Lack of appreciation of road situation	11	3	—	—
Breaches of good driving habits	11	6	—	—
Clear breaches of law	8	2	—	1
Speeding (going too fast for conditions)	22	11	—	2
Loss of control	18	14	—	—
Visibility from vehicle or dazzle	6	2	—	—
Unsuitable or unfamiliar vehicle	3	3	—	—
Illness	2	—	—	—
Inexperience	4	2	—	—
Others	10	3	1	—
Skidding (before or after accident)				
on wet roads	17	6	—	1
on dry roads	9	2	2	2
on icy roads	17	10	—	—
Pedestrians				
Pedestrian, lack of care in crossing road	14	—	1	1
Pedestrian walking in road	1	—	—	—
Pedestrian in dark clothes at night	10	1	2	3
Other pedestrian actions not included above	3	—	1	—
Vehicle defects	20	12	—	—
Road				
Icy road	24	14	—	—
Poor street lighting	13	2	2	1
Fog or mist	8	3	—	—

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